exalt the power of the magnets, and the other made available for blasting or other purposes. Want of time prevented me carrying this out until now; but since the interesting papers of C. W. Siemens, F.R.S., and Professor Wheatstone, F.R.S., were read last month, I have carried out the idea as follows:—Two bars of soft iron, measuring $7\frac{1}{2}$ in. $\times$ $2\frac{1}{2}$ in. $\times$ $\frac{1}{2}$ in., are each wound, round the centre portions, with about thirty yards of No. 10 copper wire; and shoes of soft iron are so attached at each end, that when the bars are placed one above the other there will be a space left between the opposite shoes in which a Siemens's armature can rotate: on each of the armatures is wound about ten yards of No. 14 copper wire cotton-covered. The current generated in one of the armatures is always in connexion with the electro-magnets; and the current from the second armature, being perfectly free, can be used for any purpose for which it may be required. The machine is altogether rudely constructed, and is only intended to illustrate the principle; but with this small machine three inches of platinum wire ·01 can be made incandescent.

March 21, 1867.

Lieut.-General SABINE, President, in the Chair.

Dr. Thomas Sterry Hunt and Dr. Thomas Richardson were admitted into the Society.

The following communications were read:—

I. "Computation of the Lengths of the Waves of Light corresponding to the Lines in the Dispersion-Spectrum measured by Kirchhoff." By GEORGE BIDDELL AIRY, F.R.S., Astronomer Royal. Received March 2, 1867.

(Abstract.)

The author, after adverting to the excellence and importance of the spectral measures made by Professor Kirchhoff, points out that these measures are not available for physical inquiry until we have deduced from them the length of the light-wave corresponding to each line. The author therefore undertook the work of computing the lengths of the light-waves. For this purpose, he referred to Fraunhofer's direct measures of the lengths of the waves corresponding to certain lines, and, ascertaining the numerical measures in Kirchhoff's scale corresponding to the same lines, he expressed Fraunhofer's wave-lengths by an algebraical formula, in which the variable quantity was Kirchhoff's measure. This formula was applied to each of the lines (about 1600 in number). The wave-lengths were at first obtained in parts of the Paris inch; but all were ultimately converted into parts of the millimetre.

The author then adverts to the suspicion of inaccuracy in some parts of these results, arising from the circumstance that Kirchhoff's apparatus was not always in precisely the same state of adjustment. After expressing his own *à priori* belief that the error, if any, must be extremely small, he adverts to the comparison which he was now enabled to make between direct measures of wave-length by Ångström and Ditscheiner, and his own computations. Admitting the systematic errors of Fraunhofer which the later philosophers have indicated, and the errors incidental to interpolation and extrapolation, the remaining discrepance is very small. Its progress is so easy that there is no difficulty in interpolating its value for any one line; and thus, using the computed wave-lengths of this memoir, the wave-length for any line may be found as it would have been measured by Ångström or Ditscheiner.

In the tabular part of the communication, the principal Table contains Kirchhoff's measures and symbols, extracted from the Berlin Memoirs 1861 and 1862, with the addition throughout of one column containing the author's computed wave-lengths expressed in parts of the millimetre. This is followed by a special Table, in the same form, for the lines produced by certain metals not included in the general Table. There is then given a Table of the wave-lengths corresponding to the lines produced by different metals, extracted by the author from the general Table. And finally there are given two Tables containing respectively the comparisons of Ångström's and Ditscheiner's direct measures of wave-lengths with the wave-lengths computed by the author.

II. "On a remarkable Alteration of Appearance and Structure of the Human Hair." By Erasmus Wilson, F.R.S. Received March 12, 1867.

I have the honour of submitting to the Royal Society a specimen of human hair of very remarkable appearance. Every hair is brown and white in alternate bands, looking as if encircled with rings; and this change of aspect extends throughout the whole length of the hair, and gives to the general mass a curiously speckled character. The brown segment of the hair, which represents its normal colour, measures about $\frac{1}{50}$ of an inch in length, or something less than a quarter of a line; the white, or abnormal segment about half that length, namely $\frac{1}{100}$ of an inch; and the two together about $\frac{1}{36}$ of an inch, or one-third of a line.

The hair was taken from a lad aged seven years and a half, a gentleman's son; he is reported as being "an active, healthy boy, quick and intelligent." He was delicate up to the age of four, having suffered in quick succession the diseases of childhood, a severe attack of croup, and several attacks of convulsions. The change in the appearance of the hair was first noticed when he was between two and three years old, and has